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The Rural Health Facilities Of Ross County, Ohio

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OHIO
AGRICULTURAL EXPERIMENT STATION
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Their Nature, Availability, And Extent Used

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I. INTRODUCTION

Among the many problems of living in the open country the problem of health has ever held a prominent place. In the earlier days of urban growth when cities found it difficult to keep their death rate lower than their birth rate the conception became popular that the open country was a healthy place in which to live. Gradually, however, the developments of medical and sanitary science and public health education have lowered the urban death rate until it threatens to overtake the more slowly falling rural rate.

The efforts of medical science have been concentrated in the cities leaving for the open country only those health values of a quiet life close to nature upon which the early concept of the country as a healthy place in which to live was based.

Health standards of today include not only a healthy general environment but ready access to a variety of health agencies which society has developed and come to look upon as indispensable. Prominent among these are the physician, the nurse, the hospital, the dentist, and some form of public health organization and education. It is a notorious fact that these agencies are generally either inadequate or lacking in the rural districts. Numerous studies have showed the country physician to be inferior in training and often inaccessible. Trained nursing and hospital service are only meagerly used by country people; and public health organization, tho established in many rural districts, is only beginning to be effective.

1. THE PROBLEM

It was the purpose of this study—First, to determine the existence, nature, and location of the rural[1] medical and health facilities in a rather typical Ohio county and to set forth the condi-

[1]This study includes within its scope only those people who live in the open country, for apparently it is there that the problem of obtaining adequate health service is most acute. Because of this fact the results are not strictly comparable with any of the official "rural" statistics now issued. The scope of the study most nearly approaches that of the farm population, tho 10 percent of the families visited were not directly engaged in agriculture (see p 24). Population statistics include as "rural" all places under 2500, and vital statistics include all places under 10,000. That these coincide in their scope in Ross County is due to the accidental fact that the county has no place between 2500 and 10,000 population.

tions of their use; Second, to learn the extent to which country people use these facilities and the factors which make for variability in such use. In more concrete terms, the study deals with the doctors, dentists, hospitals, nurses, and all other such medical and health agencies operating within the area selected, together with their service relation to the country people of the area. Tho not a primary objective of the study, some data were obtained relative to the need for such health agencies as are under consideration.

2. METHOD OF STUDY

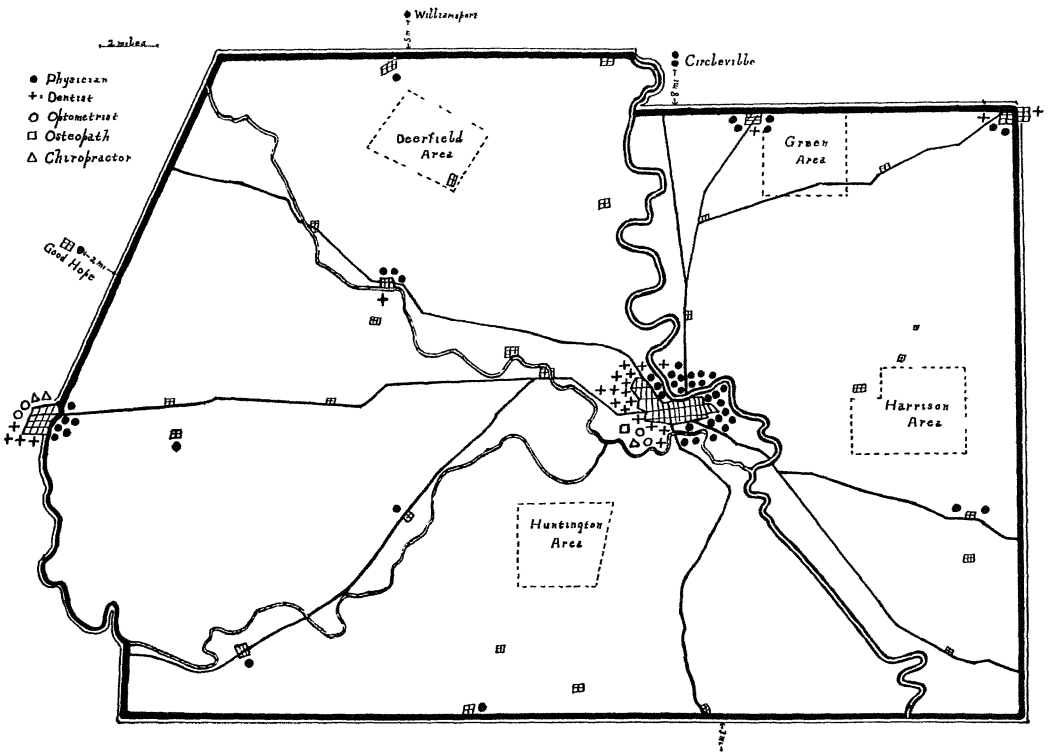
The survey method of study was followed thruout. Ross County, Ohio, was chosen as a county fairly typical of Ohio, because it contains a variety of economic and social conditions characteristic of both the southeastern hilly and the level western portions of the State. Furthermore, it is a large county, chiefly rural and with a county health organization which, it was hoped, might be used to good advantage. Health conditions are not far from average for the State.

All public and private health agencies, doctors and other practitioners, dentists, nurses and midwives, hospitals, etc., serving the rural parts of the county were visited, whether located in the county or not. Schedules were used and the point of view of the agency obtained. Following this, four sample areas of fifty families each representing four different sections of the county were visited and data obtained relative to the use of these agencies by farm families for a period of one year preceding the survey. The method of selecting these samples is described on page 24. The field work was done during the summer of 1925.

3. CHARACTERISTICS OF ROSS COUNTY

Ross County has an area of 668 square miles and lies in the south central part of the State. It is traversed from north to south by the Scioto River which, with important tributaries, provides many acres of rich lowlands. The southern and eastern parts of the county belong to the hills of southeastern Ohio and are very rough. They are inhabited by a backward population. The northern half of the county merges into the level expanse characteristic of central and western Ohio and is excellent farm land.

The facilities for communication in Ross County make it easily accessible. Three railway lines follow the Scioto Valley thru Chillicothe and another cuts the southwestern part of the county. Regular traction service connects Chillicothe with Columbus. Four state highways cross the county, two running north and south and



Ross County, Ohio: Location of Health Agencies and Areas Surveyed.

two east and west. These as well as two other roads are maintained in excellent condition. Bus lines operate on schedule over north and south roads.

The hill roads are not so good. Many in such townships as Harrison and Franklin have been entirely abandoned and many others have not yet been improved by the application of gravel.

TABLE 1.—Farms and Farm Property, 1925

Item	Ross County	Ohio
Land area in farms, percent	86.8	85.2
Average acres per farm, number	130.0	90.8
Classification of farm land –		
Crop land, percent	42.9	52.6
Pasture land, percent	38.2	36.6
Woodland, percent	12.1	6.4
Other land, percent	6.8	4.4
Value of all farm property per farm, dollars	9,849	9,141
Value of land and buildings per farm, dollars	8,591	7,951
Value of land alone per acre, dollars	50.04	58.46
Value of livestock per farm, dollars	871	790
Value of implements and machinery per farm, dollars	400	382

Agriculturally, Ross County as a whole ranks above the average for the State. While the average land value as given by the census is about eight dollars less than the state average, this average includes much hill land that is unfit for agriculture except of a primitive sort. The northern part of the county and the river bottoms contain much valuable farm land.

The average acreage per farm is much higher than for the State, due largely to more than an average number of farms of 175 acres or over. The distribution of farms under 50 acres in Ross County is almost identical with that of the State. The number of farms decreased steadily from 3301 in 1900 to 2856 in 1925, and the land acreage in farms decreased during the same period from 405,198 to 371,189. The ratio of tenancy declined from 32.5 percent in 1910 to 27.8 percent in 1925.

The general type of farming in Ross County is "corn—hogs", corn being the principal field crop. The acre yield of the principal crops is given in Table 2. Since 1880 the corn acreage has increased but slightly, while the wheat acreage has increased by half, and the hay acreage has doubled. The number of cattle has increased but slightly since 1860, the number of dairy cows remaining about constant since 1890. The number of hogs has showed little change in forty years. The leading products sold are hogs, wheat, corn, and beef cattle. In 1920 the average value of farm products sold was $1342.92 per farm.

There are two canning factories, one at Chillicothe and one at Frankfort. These can much garden truck (corn, beets, peas, and beans) which is grown in the central and northern parts of the county. During the canning season they provide an additional demand for labor for people in the locality. The Mead Pulp and Paper Company at Chillicothe utilizes much of the second growth timber of the hill sections and thus furnishes an additional source of income in the hill section.

TABLE 2.—Yield per Acre of Ross County Crops

	1890—99	1909—09	1910—19
Corn, bushels	35.8	38.1	41.5
Oats, bushels	17.4	21.8	25.7
Wheat, bushels	13.4	14.0	15.6
Hay, tons	0.78	0.78	0.73
Potatoes, bushels	68.7	80.4	78.3

On July 1, 1922, Ross County had an estimated population of 42,092. The one city, Chillicothe, had an estimated population of 16,649 in 1925. The growth in population of both county and city has been very slow. The county was 38 percent urban in 1920, and the density of the rural population was 38 persons per square mile.

TABLE 3.—Composition and Characteristics of the Population of Ross County, Ohio: Sex, Nativity, and Color by Urban and Rural, 1920*

	Total county	Urban (Chillicothe)	Rural
Total population	41,556	15,831	25,725
Male	21,510	7,494	14,016
Female	20,046	8,337	11,709
Native white	38,552	14,490	24,062
Male	19,842	6,812	13,030
Female	18,710	7,678	11,032
Foreign born			
White	770	379	391
Male	507	195	312
Female	263	184	79
Negro	2,232	961	1,271
Male	1,159	486	673
Female	1,073	475	598
Others	2	1	1

*Fourteenth Census of The United States Vol. III, 1920.

Reduced to a percentage basis, the county in 1920 was 92.8 percent native white, 1.9 percent foreign born white, and 5.4 percent negro; Chillicothe was 91.5 percent native white, 2.4 percent foreign born white and 6.1 percent negro; the rest of the county was 93.5 percent native white, 1.5 percent foreign born white and 4.9 percent

negro. Compared with the percentages for 1910, the 1920 figures show an increase in the native white component of the population and a decrease in the other two classes. The decrease is greater in the foreign born white group than in the negro group.

TABLE 4.—Composition and Characteristics of the Population of Ross County, Ohio: Age and Sex by Urban and Rural, 1920*

	Total county	Chillicothe	Rural
Total population	41,556	15,831	25,725
Male	21,510	7,494	14,016
Female	20,046	8,337	11,709
Under 7	5,899	2,097	3,802
7—13 years	5,516	1,779	3,737
14—15 years	1,414	419	995
16—17 years	1,406	427	979
18—20 years	2,252	740	1,512
21 and over	25,069	10,369	14,700
Male	13,158	4,932	8,226
Female	11,911	5,437	6,474
Males 18—44 years	8,962	3,297	5,665
Females 18—44 years	7,757	3,562	4,195
Males per 100 Females			
All ages	107.3	89.9	119.7
21 years and over	110.5	90.7	128.1
18—44 years inclusive	115.5	95.4	135.0

*Fourteenth Census of The United States Vol. III, 1920.

The age and sex composition of the population in the urban and rural parts of the county differ much. In Chillicothe 13.2 percent are under seven years, 43.3 percent between the ages of 18 and 44, and 65.4 percent over 21 years. The corresponding percentages for the remainder of the county are 14.3, 38.3, and 57.1. It is evident that Chillicothe, like most cities, has a surplus of population in the producing ages and that the rural districts have suffered correspondingly from migration. The usual low proportion of males in the cities and high proportion in the rural districts are also found.

TABLE 5.—Crude Death Rate for Ross County, the State of Ohio, and the Registration Area; 1918-1924, Inclusive*

(Number of deaths per 1000 population)

	1924	1923	1922	1921	1920	1919	1918
Ross County	12.0	13.6	11.2	12.2	12.5	14.5	27.7
Ohio	11.2	12.3	11.3	11.3	12.8	12.7	16.8
Registration area	11.9	12.4	11.9	11.7	13.1	13.0	18.3

*Mortality Statistics of the United States Bureau of the Census and the Division of Vital Statistics of the Ohio State Department of Health, are used in Tables 5, 6, and 7.

The death rate in Ross County has been slightly above that of the State during the past seven years. The large number of deaths in 1918 was no doubt due to the influenza epidemic which swept the federal cantonment at Camp Sherman located at Chillicothe.

TABLE 6.—Crude Birth Rate for Ross County, the State of Ohio, and the Registration Area; by Urban and Rural for 1918-1923, Inclusive*

(Number of births per 1000 population)

	1923	1922	1921	1920	1919	1918
Ross County						
Urban	25.8	25.0	23.3	25.9	22.7	24.4
Rural	24.8	24.4	24.1	24.0	22.2	23.8
Ohio						
Urban	21.7	20.6	22.3	22.5	21.3	24.1
Rural	21.1	20.2	21.3	19.8	18 2	20.3
Registration area						
Urban	22.3	22.2	24.0	23.8	22.7	25.1
Rural	22.5	22.8	24.7	23.6	22.0	24.0

*See note, Table 5.

The birth rate in Ross County, both urban and rural, was above that of the State for the period covered by Tables 5 and 6. The urban rate was higher than the rural rate with the exception of the year 1921. The difference was not great however.

TABLE 7.—Infant Mortality Rate for Ross County, the State of Ohio, and the Registration Area; by Urban and Rural, 1918-1823, Inclusive*

(Number of deaths per 1000 births)

	1923	1922	1921	1920	1919	1918
Ross County						
Urban	97	40	82	59	92	93
Rural	103	92	96	89	114	86
Ohio						
Urban	75	76	76	89	94	100
Rural	75	65	72	74	85	87
Birth Registration area						
Urban	78	80	78	91	89	108
Rural	76	72	74	81	84	94

*See note, Table 5.

The urban infant mortality rate in Ross County was comparatively favorable during the period of years covered by Table 7. The rural rate was considerably higher than the rate for the State and showed no signs of decreasing. It was above the urban rate for the county for every year except 1918. No doubt there were many reasons for the higher rural rate, but inadequate care at birth was certainly a chief factor. Infant mortality is likely to be high when the mother has no care before, during, or after childbirth as happened in many cases in various sections of the county. This is discussed further in the section on the physician.

TABLE 8.—Specific Death Rates for Chief Causes of Death in Ohio and in Ross County

Cause of Death	Ohio					Chillicothe					Rural Ross County				
	1924	1923	1922	1921	1920	1924	1923	1922	1921	1920	1924	1923	1922	1921	1920
Tuberculosis (all forms)	81.7	85.8	85.2	89.2	102.1	54.7	61.3	67.9	81.1	106.9	143.2	127.7	92.9	128.0	131.9
Pneumonia	91.6	118.5	100.1	86.2	137.0	85.2	128.8	86.5	93.5	100.6	92.9	120.0	100.6	97.0	108.6
Cancer	95.2	94.5	92.2	89.3	88.4	194.6	116.5	98.9	99.8	113.2	96.8	46.4	81.3	69.8	69.8
Influenza	14.7	41.7	24.1	9.9	65.1	24.3	36.8	12.4	12.5	18.9	27.1	104.5	19.4	31.0	89.2
Puerperal state	13.4	14.9	13.1	15.5	16.8	12.2	42.9	30.9	6.2	25.2	19.4	7.7	15.5	19.4	7.8
Typhoid	3.6	5.0	5.6	9.1	7.5	18.2	0.0	24.7	43.7	12.6	0.0	7.7	3.9	27.2	3.9
Whooping cough	7.4	8.2	4.9	8.5	14.1	18.2	36.8	0.0	6.2	6.3	7.7	0.0	7.7	38.8	7.8
Diphtheria	6.7	11.2	13.8	18.2	11.0	0.0	6.1	12.4	6.2	6.3	3.9	23.2	23.2	27.2	11.6

Table 8 indicates that the city of Chillicothe had death rates higher than the State average for cancer, typhoid, the puerperal state, and whooping cough; and lower than the State for tuberculosis, pneumonia, influenza, and diphtheria. The rural part of the county had rates higher than the state average for tuberculosis, influenza, whooping cough, typhoid, and diphtheria; and lower for cancer, the puerperal state, and pneumonia. The rural part of the county had rates higher than those of Chillicothe for tuberculosis, pneumonia, influenza, and diphtheria; and lower for cancer, typhoid, whooping cough, and the puerperal state.

II. THE HEALTH AGENCIES

1. THE HEALTH COMMISSIONER AND THE HEALTH NURSE[2]

Ross County is a combination city-county district with a full-time commissioner presiding over the two districts. The county has had a health commissioner since the advent of the Hughes-Griswold law in 1919 providing for one. The commissioner receives $3800 per annum for his services. His staff consists of a sanitary officer for each district, and a chemist who makes chemical and simple bacteriological analyses. While the county (rural) district now has no nurse, it had one up until April 1, 1925, when she left the position because of ill health.

The health commissioner, in addition to his duties as a sanitary officer, made physical examinations of nearly all school children in the county, working in conjunction with the nurse who did some follow-up work to see that corrections were made. Many of these examinations appeared to be quite brief, however. Bad teeth and tonsils were practically the only things checked in the later examinations. Some of the teachers in the public schools complained that the form card sent to the parents informing them of the results of the examination was insufficient follow-up to secure correction of the defect.

Some schools in the county were having hot lunches as a result of the activities of the health commissioner and his staff. The commissioner also encouraged the drinking of milk, in the county as well as in the city. He estimated that the milk consumption of Chillicothe had tripled since his campaign against underweight in children, and the dairymen corroborated his statement. Many children in the county were very much underweight. According to

[2]For state wide distribution of these see: Ohio Public Health Association, Graphic Health Service Series, 1923, Nos. 8 and 12.

the statistics of the health commissioner, obtained from weighings of all the children in the rural schools made in September and October, 55.8 percent of the children of the rural schools were underweight in 1922, 56.4 percent in 1923, and 41.1 percent in 1924. Weighings made in March and April showed 24 percent underweight in 1923 and 21.5 percent in 1925. Hence it is clear that there was some improvement during the period. The March and April weights were consistently above those of September and October, but it would be unsafe to credit all this gain to the work of the health authorities. The children probably would have gained in weight during the winter anyway. An interesting thing in this connection is that the highest percentages of underweight children came from some of the townships which are rated as the best farming sections.

In addition to the work in the schools the health commissioner, thru his sanitary officers, each year made a sanitary survey of one township in the county. Five surveys had been completed at the time of this study. Samples of the drinking water were taken and analyzed and serious menaces to health abated. Suggestions for improvement were made, and if the suggestions were not followed appropriate legal action was taken. These surveys were thoro and very valuable. Unfortunately for future work, however, no systematic tabulation of the results was made and much of the miscellaneous data collected were never used.

The health commissioner and the nurse had made it a practice to make occasional talks to school children and to distribute miscellaneous health literature. According to dentists in the rural sections the education carried on in the schools had some effect, since more children were coming in for work on their teeth than formerly.

Much that is extremely valuable was being done by the health commissioner and his staff in the way of health education and prevention of disease. If it were possible for them to keep better records and do more persistent follow-up work the work could be much improved.

2. HOSPITALS[3]

The Chillicothe General Hospital is a privately organized institution. It has 29 private rooms and 2 wards of 8 beds each, a total of 45 beds. It has no free ward and cared for but few free cases.

[3]For distribution of hospitals in Ohio in 1922, see: Ohio Public Health Association Graphic Health Service Series, 1923, Nos. 2 and 9.

These were emergency cases as the hospital does not accept charity cases as such. Fees averaged about $18 per week for the wards and $30 to $35 for rooms.

This is a very well equipped small hospital. Its facilities consist of an operating room, delivery room, emergency room, X-ray, and laundry. A small laboratory for simple analyses is available. It has no clinic or dispensary. The hospital is open to all physicians of the city; outside physicians may come in if the patient so desires, and some of the best surgeons in the State perform operations here. There are thirteen full time nurses but no house physician. During 1924, 508 cases were admitted, 485 were discharged and there were 49 deaths. The superintendent estimated that less than 25 percent of the cases were rural cases.

The Mount Logan Sanatorium is located on a high hill just west of Chillicothe. It is supported by Ross, Highland, Scioto, Pike, Fayette, and Jackson Counties by appropriations made by the county commissioners of the counties concerned. It is a public hospital for tuberculous patients, as the name implies. Admission is authorized by the county commissioners of the county from which the patient comes. The hospital has 40 beds. At the time visited, there were 33 patients, only one paying full maintenance. The hospital has a small laboratory, but no dispensary. During 1924, 46 persons were admitted, 4 were discharged as arrested cases, 17 were released, and there were 17 deaths. When admitting patients no discrimination was made as to the stage of the disease, hence, the high death rate. Few cases got to the hospital until they were in advanced stages of the disease. This hospital when visited had a full time superintendent, and a staff of five nurses. Until the last six months the hospital had no full time physician in charge and the work had been more or less unsystematized.

The hospital is a good one tho small, and about 80 percent of the cases were rural. It appeared not to be rendering the best service possible, however. Physicians complained that the method of admission made it difficult to get patients into the hospital. The rural people generally will consent to hospital care only in extreme cases with the result that the "curative" record of the hospital is not very favorable.

A general hospital located at Greenfield, just over the western border, is available to Ross County people. It had been organized as a stock company, but was being changed to a non-profit organization. It contains 12 rooms and 16 beds, with three day nurses on duty. It is equipped with operating room and delivery room.

There is no emergency room, laboratory or laundry, no clinic or dispensary and no charity ward. It accepts all cases except infectious and contagious disease, and from one-third to one-half its cases come from the rural districts, probably half of these or less from Ross County.

3. THE JOSEPH ENDERLIN WELFARE HOUSE

This is an endowed institution controlled by a board of directors chosen from the city of Chillicothe. It is not a health organization in the strictest sense. It houses the office of the county board of health and has in addition an emergency room where minor operations may be made by any physician. While the Welfare House is a city institution it must be included here as a part of the health facilities of the rural part of the county because its facilities were used by rural health agencies and for the care of rural people. A trained social worker and a nurse compose the staff. The nurse occasionally does some rural work in indigent cases about Chillicothe.

4. PHYSICIANS

The physician is easily the most vital health agency in the lives of people generally. Perhaps this is even more true of rural people who use hospitals, nurses, and dentists so little. Much has been said in recent years concerning the decline of the rural physician[4], hence, particular care was exercised in this study in order that the true situation with reference to the rural physician in Ross County might be depicted.

Of the 51 physicians visited, 26 were located in the city of Chillicothe, 16 in various parts of rural Ross County, and 9 outside the county. The aim was to visit all physicians who did rural work in the county, whether urban or rural in their location and whether located within or without the county. The data of Table 9 indicate the percentage of births in rural Ross County in 1924 that were attended by the physicians visited. The percentage of the total medical service rendered by a group of physicians, such as those practicing in Ross County, it is contended, is closely correlated with the percentage of the total number of deliveries at childbirth performed by them, because of the prevalence of the "family doctor" who ministers to all of the family's ills. In 1924, 11.3 percent of the total births in the county were attended by physicians with offices

[4]For recent figures concerning the physicians in Ohio see The Ohio Public Health Association, Graphic Health Service Series, 1923, No. 15; also C. E. Lively, Some Rural Social Agencies in Ohio, Ohio State University Extension Service, Bul. 1922.

outside the county. This 11.3 percent was composed of the 5.2 percent attended by Greenfield (Highland County) physicians, 2.0 percent by Waverly (Pike County) physicians, 1.2 percent by Williamsport (Pickaway County) physicians, 1.2 percent by Circleville (Pickaway County) physicians, and 1.5 percent by others. The 51 physicians visited attended 91.2 percent of the births in the county in 1924. Midwives attended 4.1 percent and 1.5 percent had no medical attendance. This leaves only 3.2 percent of the medical attendance at childbirth unaccounted for. No doubt this is a fairly good measure of other medical service. It will be seen from these figures that the group of physicians visited included nearly all those practicing in the rural part of the county.

TABLE 9.—Medical Attendance at Births in Rural Ross County, 1924

	Number	Percent
Total births and stillbirths	587	100
Attended by physician	554	94.4
Attended by Chillicothe physician	156	26.6
Attended by rural physician of county	323	55.0
Attended by physician outside county	66	11.3
Attended by Greenfield physician	31	5.2
Attended by Waverly physician	12	2.0
Attended by Williamsport physician	7	1.2
Attended by Circleville physician	7	1.2
Attended by other physician outside county	9	1.5
Attended by U. S. Veterans Bureau physician*	9	1.5
Attended by midwife	24	4.1
No attendance	9	1.5

*Births at the United States Veterans Bureau Hospital; these physicians were not visited.

Full data were gathered from only 42 of the 51 physicians visited. Of the remaining 9, 2 refused to talk about the questions asked, 2 were retired, 2 were on salary, 2 did less than 1 percent rural work, and 1 was a consultant in internal medicine. The nine from whom full data were not taken were Chillicothe physicians.

Of these 42 physicians, 11 were graduates of Class A medical schools, 4 of Class B schools, 26 of schools not now in existence, and 1 was not a graduate of medical school but held a license to practice.

TABLE 10.—Age of Physicians Visited, by Urban and Rural Location

Age group	Total Number	Rural	Urban
All ages	42	16	26
30—39 years	6	3	3
40—44 years	5	1	4
45—49 years	8	1	7
50—54 years	9	3	6
55—59 years	7	2	5
60—64 years	2	2	0
65—69 years	2	1	1
70—74 years	1	1	0
75 and over	1	1	0
Age unknown	1	1	0

Even with the small number of physicians here involved one can readily note the same difference in age distribution of the urban and rural groups as appears to characterize these two groups everywhere in the United States. The rural group lacks the large proportion of middle age men which characterizes the urban group. Only one of the urban group was more than sixty years of age but six, or 37 percent, of the rural group had passed this mark. These rural physicians really fell into two groups: (1) the older men who were in rural practice before the cityward movement began and who rather expect to stay there, and (2) the young men who are just beginning to build up a practice and obtain sufficient experience after which they will probably move to the city. The former group are generally less well trained, often charge lower fees, and like rural practice. The latter group feel that rural work is merely a stepping stone to something better. The older physicians visited cited many instances of this.

Each physician was asked to make an estimate of the amount of his practice that was rural. Table 11 gives the results of their estimates.

TABLE 11.—Age of Physicians, by Percent of Visits Rural

Percent of practice, rural	Total number	Age							
		30—39	40—44	45—49	50—54	55—59	60—69	70 and over	Unknown
100	19	3	1	2	3	3	4	2	1
50 and under 100	3	.....	1	1	.....	1	.....	.....	.....
25 and under 50	4	.....	1	1	1	1	.....	.....	.....
5 and under 25	11	3	1	1	5	1	.....	.....	.....
1 and under 5	3	.....	1	2	.....	.....	.....	.....	.....
Make no visits	2	.....	.....	1	.....	1	.....	.....	.....
Total	42	6	5	8	9	7	4	2	1

Those physicians who lived in the country did practically all rural work and did not often go into Chillicothe or any other city to visit a case. They comprise the group in the table whose visits were 100 percent rural. There was little difference in the age of the urban physicians with respect to the percentage of their visits that were made in rural sections. Inspection of the original data shows that the majority of those physicians in the urban group who had a large percentage of rural visits once were located in the rural sections to which these visits are now made. This merely indicates that when the rural physician moves to the city he continues for a time to serve his former clientele.

For those physicians whose work was only partially rural, a larger percentage of their total office work than of their house visits was rural. This seemed to be an invariable rule and probably indicates, on the one hand, that the shift from visits to office calls is the method by which the former rural physician makes the transition to an urban clientele (accomplished, of course, as a direct result of the higher fee for home visits due in part to a higher fee scale and in part to the increased distance), and, on the other hand, that, in the case of physicians who have never been located in the country, rural people like other people prefer the cheaper office call to the more expensive visit. Country people go into the city to trade and often visit the physician while there. When they call a physician to their home they usually call one who is near, tho not necessarily the nearest, as we shall see later in the study of the data on the use of medical facilities.

TABLE 12.—Estimated Number of Rural Families Served by Physicians, by Percentage of Visits Rural

Number Families	Total Physicians	Percent of Visits Rural					
		0	1–4	5–24	25–49	50–99	100
Less than 50	6		2	4			
50 and under 100	3		1	2			
100 and under 200	5			4			1
200 and under 300	4			1	3		
300 and under 400	2						2
400 and under 500	2						2
500 and under 600	6					1	5
600 and under 700	4						4
700 and over	1						1
No estimate	9	2			1	2	4
Total	42	2	3	11	4	3	19

The distribution of physicians according to the number of families served indicates that the rural physicians (those having 100 percent of visits rural) each attended an average of 500 to 600 families, since the mode, mean, and median fall in this group. The total distribution, however, due to the evident heterogeneity of the distribution among the urban physicians, shows no definite central tendency. Of course these estimates do not mean that the families indicated were regularly served or that they never saw another physician. This may easily account for the large number reported by some.

As a further check on the amount of medical service rendered to the rural sections, each physician was asked to estimate the average number of rural visits and office calls per week. The results

shown in Tables 13 and 14 indicate that the largest number, nearly 40 percent, made fewer than ten rural visits per week. Another group, nearly 25 percent, made from 20 to 30 such calls per week. This is about the average for those who did all rural work.

TABLE 13.—Average Number Rural Visits per Week Made by Physicians Doing Rural Work

Number of visits	Number of physicians
Under 10	16
10—19	4
20—29	10
30—39	6
40—49	2
50 and over	4
Total	42

According to these estimates, the number of office calls from rural people runs much higher than the number of visits made by the physicians. Those physicians devoting full time to rural work received 50 calls and over per week. These estimates agree fairly well with the data received from rural families and reported in Part III. According to the practice of 200 families, rural people made office calls and received visits from the physician in the ratio of three and a half to one.

TABLE 14.—Average Number of Office Calls per Week Received From Rural People by Physicians Doing Rural Work

Number of calls	Number of physicians
Under 10	4
10—19	4
20—29	3
30—39	8
40—49	0
50—69	10
70 and over	10
No estimate	3
Total	42

Each physician was also asked to indicate the month or months in which he had his heaviest practice. The months of heaviest practice, as given, are totaled in Table 15. While there were variations between physicians as to the seasons of heaviest practice (probably due to variation in location and specialty), it is clear that there are two seasons of the year upon which they quite generally agree that practice was heavy. These are winter months, January, February, and March and summer months, July and August.

Nearly all agreed that they had all they could do during these months. No physician named May as a busy month and only one mentioned October.

TABLE 15.—Monthly Variation of Physicians' Practice

Month	Number physicians
January	25
February	31
March	32
April	5
May	0
June	2
July	11
August	8
September	2
October	1
November	3
December	8

Physicians characterized the causes of illness during the winter months as largely those of the respiratory group, and during the summer months as very commonly those of the alimentary tract. Older physicians recalled the day when summer practice was heavy due to the ravages of typhoid. The development of medical science and public health work, however, has in later years so brought typhoid under control that the doctor's summer practice is now comparatively light.

TABLE 16.—Fee Scales Charged by Physicians for Rural Visits

Fees	Total physicians	Rural physicians	Urban physicians
$1.00 plus $0.50 per mile	2	2	0
$1.50 plus $ .50 per mile	1	1	0
$1.50 plus $ .75 per mile	3	3	0
$1.50 plus $1.00 per mile	6	6	0
$2.00 plus $ .50 per mile	5	2	3
$2.00 plus $1.00 per mile	18	2	16
$2.50 plus $ .50 per mile	1	0	1
No definite fee scale	4	3	1
Make no visits	2	0	2
Total	42	19	23

A comparison of the physicians' estimates as to the extent of illness at various seasons of the year and the record of illness obtained from the people themselves showed close agreement. According to the record most illness occurred during the months of March and August (about an equal amount in each) and least during the months of May, June, September, and October. Doctors' estimates agreed perfectly except that they considered the August peak of less importance than the March peak.

The fees charged by physicians were an important factor in the rural medical service. The country people have not yet become adjusted to the fee scales charged by urban physicians and in most cases were content with the generally less well trained country physician, because of his lower fee.

Fee scales varied within both the urban group and the rural group of physicians, but the rates of the rural group were consistently lower than those of the urban group. The most common rate among the rural men was $1.50 minimum charge plus a mileage rate of $1.00; the most common rate for the urban group was $2.00 minimum plus a mileage rate of $1.00.

Only four doctors professed to have no fee scale. Three of these were rural physicians and one was a Chillicothe physician. They stated that they fixed their charge according to the "neighborhood" in which the patient lived.

When asked what factors caused them to vary from their fee scale, 80 percent stated that they varied the fee with the supposed economic standing of the family. This variation appeared to be usually something less than the fee scale rather than more. The same conclusion is indicated from the family records reported in Part III. The price was not reduced but the mileage was taken for less than it really was, thus making a smaller fee. Weather conditions were causes for variation of the fee for 20 percent and the condition of roads for 35 percent of the physicians. For night visits 70 percent charged extra. The remaining 30 percent who did not charge extra for night visits were rural physicians in the sense of both location and nature of practice.

The charges for office calls varied somewhat among physicians, 12 charging less than $1, 28 charging $1 to $2, and 2 charging more than $2 for office calls. Here again the rural physician generally charged less than the urban physician.

The rates for delivery at childbirth varied from $15 upward. Some physicians charged mileage in addition to the fee for delivery. Detention of the physician over four hours increased the fee in some cases. The most frequent charge was $20 to $25 with mileage extra.

The charges in maternity cases varied more than Table 17 indicates, however. In many cases where the family was poor the physician made several calls and charged only his regular maternity fee. The physicians who had fees under $20 were rural physicians. Physicians stated that in the case of poorer people they often asked for pay in advance of the service.

With rare exceptions prenatal care for the mother was an unusual thing in the rural parts of the county. In most cases one visit from the physician is all that was called for, that being at the time of delivery. However, physicians were refusing to attend cases which they had not accepted in advance and this fact was bringing advance notification from the people. It may lead to prenatal care.

TABLE 17.—Fee Scales Charged by Physicians for Childbirth

Fee	Number physicians	Number charging mileage extra
Under $15	1	
$15—$20	3	1
$20—$25	32	14
Over $25	1	1
Handle no cases	5	
Total	42	16

General surgery was practiced by 3 physicians, 1 of whom was located in Chillicothe and 2 were in Greenfield. Minor surgery was practiced by 27 of the 42 physicians. In surgical cases the fees varied considerably, depending largely upon the ability of the patient to pay.

Pay from some public source was received by 9 of the 42 physicians. Some were township physicians, that is, they received a specified sum from the township as payment for serving the poor of the township, and 1 was a county physician.

In answer to the question, "Are rural people good pay?" 22 replied in the affirmative without any qualifications; 11 replied, "Yes when they are able to pay"; 6 said "Yes, but they are slow"; 3 physicians, all located in Chillicothe, gave negative replies. Several Greenfield physicians replied that rural people are on the average much better pay than city people.

A much larger percentage of the urban than of the rural physicians claimed that they had all the work that they could do. Of the 19 rural physicians only 10 and of the 23 urban physicians 19 said they had all they could do. It is difficult to say, however, whether these professed differences are real to the degree indicated. It is probable that such expression by rural physicians represented actual conditions, but it is likely that a higher professional morale among urban physicians make them more wary of admitting dissatisfaction or insufficient practice.

To one who has carefully studied the situation, however, it is clear that the rural physician is often the victim of a changing situation. With the advent of modern science the standards of medical practice have been greatly and rapidly raised. Medical appliances making water supply, electricity, and the like office necessities have brought the urban specialist to the fore and placed great emphasis upon office work. Rural physicians, noting the change, have accordingly shifted to centers of population where they are more favorably situated for doing up-to-date medical work but less favorably situated from the standpoint of making calls into the remote rural districts at a figure acceptable to the people.[5]

Rural physicians find their practice being reduced on the one hand by the control of disease thru public health measures and on the other hand by the inroads of the urban specialists. They see the situation and some complain but their chief method of adjustment is to leave for a more lucrative field. And as long as the health standards of country people remain below the preventive stage and they are unwilling to give a good all-round physician a chance to keep them well it may be that migration will for some country physicians be the method of adjustment. Others perhaps may take their cue from the neighborhood store, become a specialists in diagnosis and emergency and minor work and thus in part create a new place for themselves in a period of rapid social change.

5. OSTEOPATHS

One osteopath was found to be practicing in Ross County. His office was in Chillicothe and his practice was largely urban. He was 30 years of age and apparently enjoyed a good reputation among the medical men of Chillicothe altho they did not speak of him as one of the physicians of the city.

6. CHIROPRACTORS

Only three chiropractors were interviewed. One of these was located in Chillicothe and two in Greenfield. A few more were listed in the Chillicothe directory but the investigator was unable to locate them. From what could be learned they appeared to be more or less transient. The chiropractor visited in Chillicothe held a license from the Ohio State Medical Board. He did little rural work in the county, however. The Greenfield chiropractors, a man and wife, refused to answer questions or give any information relative to their practice.

[5]Of course there are many other factors involved in the shift of physicians from the rural districts but there is no intention of developing a general discussion of the problem here.

7. DENTISTS

All of the dentists in Ross County and those in Greenfield were included in this survey. There were 12 located in Chillicothe, 4 in Greenfield, and 1 each in Frankfort, Kingston, and Adelphi. Of these 19 dentists, 16 were interviewed and replies were obtained from 14. Two of the Chillicothe dentists were on their vacations and three of them would not answer questions. Those visited ranged in age from 30 to 63 years, with an average age of 47 years. There was no marked difference between the ages of urban dentists and rural dentists as was the case with physicians.

Table 18 gives a fair idea of the fees charged by these dentists. The fees appeared to vary more between individual dentists than between urban and rural locations as was the case with physicians. With 9 of the 14 dentists charges also varied with the supposed economic standing of the family for whom the work was done. The most uniform charge was that for extraction, all but three charging one dollar.

TABLE 18.—Fees of Dentists Doing Rural Work

	Cost range	Approximate average
Fillings		
Gold	$2.00—$15.00	$3.50
Silver	$1.00—$ 3.00	$1.50
Synthetic	$1.50—$ 5.00	$2.50
Bridgework and crowns (per tooth)	$5.00—$10.00	$7.50
Prophylaxis	$1.00—$ 5.00	$2.25
Extractions	$0.50—$ 2.00	$1.00

The work of the dentists was largely cash. Estimates ranged from 67 to 99 percent, with an average of 70 percent cash. Collections for work done ranged from 90 to 100 percent, averaging 95 percent.

The Greenfield dentists examined the school children of the town once each year free. Some of the Chillicothe dentists did free work for the Joseph Enderlin Welfare House, but aside from this there was no clinical work. Estimates of the number of visits per week by rural people ranged from 5 to as many as 40. The average number was from 20 to 25 per dentist. The three dentists who did rural work only (those located in the villages of Frankfort, Kingston, and Adelphi) averaged 25 calls per week from country people. One of these, who made home calls on occasion, also did X-ray work for the local physicians. Another spent some of his time operating a farm which he owned.

Few of the dentists did any itinerant work. One Chillicothe dentist made regular trips to Bainbridge for two days' work each week. Another made occasional trips from Adelphi to Lancaster.

Dentists reported that rural work was heaviest during January, February, and March, and lightest during July and August. Two said there was little difference thruout the year. They attributed the increase in work in the fall of the year to the facts that the farmers have more leisure and more cash on hand after the harvest season.

Dentists also stated that country work is usually "eleventh-hour" work, but that the situation is slowly changing, especially among the younger people. Some credited this change to the work of the health commissioner in examining school children. No doubt this work played an important part since in these examinations considerable emphasis was placed upon the condition of the teeth.

8. OPTOMETRISTS

Five optometrists were visited, three in Chillicothe and two in Greenfield. Those located in Chillicothe estimated their work to be 50 percent rural; and those in Greenfield, 40 percent rural. The fee for examination was $2 in each case. Collections were high, ranging from 90 to 100 percent, they said. August and December were given as the heavy months for optical work. Much of this was due to the fact that school starts in September and children were fitted with glasses before they entered school. Many people spend Christmas money for glasses, they thought, thus accounting for the large amount of December work.

Two of the optometrists who worked in the same office in Chillicothe also maintained an office in Waverly where they worked two days each week.

9. NURSES AND MIDWIVES

The sixteen graduate nurses attached to the Chillicothe and Greenfield hospitals were not available for out work. In addition to these there were at the time of the survey ten graduate nurses in Chillicothe. These did only occasional rural work. Investigation showed, however, that the graduate nurses were rarely employed in the rural sections and those used generally came from Columbus. Rural nursing was done almost entirely by the "practical" nurse or midwife. Many physicians expressed a preference for this type of nurse for rural cases since she is more accustomed to the inconveni-

ences of the average rural home, and is willing, in addition to her regular duties, to act as cook, housekeeper, and the like during her stay.

Practical nurses were scattered thruout the rural districts but were difficult to locate and interview. Thru the cooperation of the physicians, the names and addresses of nineteen were obtained and a questionnaire was mailed to each. Replies were received from thirteen.

The group consisted of women who made a regular practice of nursing as well as those who occasionally took a case in their immediate neighborhood. Their ages ranged from 19 to 62 years, with an average age of 46 years. Fees ranged from $5 to $42 per week. Two Greenfield nurses got $35 and $42 per week, respectively. One of these had had some hospital training. The other had no academic training, but was considered one of the best nurses in Greenfield. She had more cases than she could handle, at $35 per week. About 50 percent of her work was rural. Two nurses, getting $5 and $7 per week, respectively, were located at Vigo and Gillespieville and were the only two to answer the inquiries from that section. Aside from these four, fees ranged between $15 and $20. The amount of their work obtained thru physicians ranged from 10 to 80 percent. Only three of this group did any hospital work. They were located in Greenfield.

Many other women in the rural sections did some nursing, according to reports, especially in their own families, but those who did not make a practice of nursing could not be located and interviewed. This practice of the mother or grandmother doing the nursing extended to other medical services, especially in the hill country. Birth statistics (taken from the birth certificates in the county office) showed that in 1924, 33 (5.7 percent) of the births in rural Ross County had no medical attendance. These 33 consisted of 24 (4.2 percent) reported by midwives and 9 (1.5 percent) reported by parents of the child. This percentage is not unduly large if it had been distributed over the entire county, but 21 of the 33 births represented by the 5.7 percent occurred in two townships, Harrison and Franklin. Practically all of the 33 occurred in the poorer hill districts. The two townships named are the most precarious in the county from the standpoint of returns from agriculture. In Harrison 38 and in Franklin 42 percent of the births in 1924 were without medical care. Most of the deliveries were made with the attendance of some member of the family, usually the mother of one of the parents.

Midwives operated quite extensively in these hills as the records show. Their charges varied from $5 to $15, including a week's care if it were thought necessary.

It may be said, then, that the rural people of Ross County do not have easy access to trained nursing service. But they do not care to use trained nurses to any extent. They can hardly afford to pay the price required for such service and cannot compete with those who are willing to pay for the service. Trained nurses hesitate, as a rule, to go into country homes because of the usual lack of conveniences. Ross County physicians reported cases where a trained nurse had been supplied but had left after the first week without any assigned reason. Rural physicians complained that trained nurses too often failed to obey orders strictly, apparently thinking they knew better than the physician what should be done. As a result most rural physicians generally preferred a "practical" nurse.

III. THE USE MADE OF EXISTING FACILITIES BY RURAL PEOPLE

1. CHARACTERISTICS OF THE AREAS AND FAMILIES VISITED[6]

For house to house study four sample areas of 50 families each were selected in different parts of the county (See map). These areas were chosen as representative of the conditions in different parts of the county and whether or not they are, depends upon how well the factors of variability were balanced off against each other. The major factors considered were topography, soil fertility, type and economic condition of agriculture, accessibility to the outside in general and to health agencies in particular, social and economic classes, and general health conditions.

At first it might seem to be a hopeless task to balance these many factors so as to secure adequate representation in four samples. However, it was not so difficult as it appears, for many of the factors vary together. The hill sections, which comprise half of the county are least accessible because of poor roads and distances to health agencies. They are also poorly adapted to farming and the agriculture is both simple and relatively unprofitable. Farms are small and ownership the rule. Two samples were taken from the hill sections, one from Harrison township in the eastern half of the county and one from Huntington township in the south central part of the county.

[6]No attempt was made in this study to distinguish between the genetic family and the household Aside from the cases of single individuals living alone there were very few cases of boarders or others who were not normally members of the family Hence, the term "family" is used in this study to include all who normally live under the same roof.

The Harrison sample was taken as the poorest of the four areas and as representative of the poorest the county had to offer. Agriculture is quite primitive. The wooded hills supply much timber for wood pulp. Most of the people are land owners, tho land in these hills may be almost a liability. The area is almost inaccessible in winter, and there is much poverty.

The Huntington area is rough but not as rough as the Harrison area. The high, flat-topped ridges make better farming possible. The people are descendants of the original settlers of the area. There was less poverty than in the Harrison area, but the distance to health agencies represented the extreme for the county.

The level half of the county consists of the entirely level or rolling northern part and the broad river and creek valleys of the southern part. Good roads and a sprinkling of fair sized villages with physicians made access to health facilities reasonably easy. Land is good and agriculture well developed. The chief factor of variation appeared to be that of ownership and tenancy. To represent the area of most tenancy one sample was taken in Deerfield township, where fully one-third of the population are farm laborers. Another was taken in Green township, among the prosperous owners in the northeastern part of the county, to represent the best conditions the county had to offer.[7]

So far as health conditions were concerned the county health commissioner concurred in all of the selections.

Of the 200 families visited, 20, or 10 percent, were engaged in occupations other than agriculture. This non-farmer group included 1 stationary engineer, 3 threshing machine and sawmill operators, 1 teamster, 1 school teacher, 2 railroad workers, 1 storekeeper, 1 auto mechanic, and 1 cemetery keeper. The remaining 9 worked in the canning factories at Frankfort and Chillicothe.

Two striking characteristics were evident among the areas: first, the greater percentage of farm owners in Harrison and Huntington, the poorer areas agriculturally; and second, the large percentage of farm laborers in Deerfield.

[7] The validity of the four-area sample of 200 families may be checked in other ways. In the first place, there was a close relation between the distribution of farms by size in the sample and their distribution in Ross County and Ohio. The distribution of the sample followed that of the State a little more closely in that the greatest frequency occurred in the 50- to 99-acre group, while in the county it occurred in the 100- to 174-acre group. The sample contained proportionately fewer farms under 20 acres than either the County or State, due to the fact that no families were surveyed in close proximity to the city where small farms are usually located.

In the second place the age distribution of the population of the sample was sufficiently close to that of the rural population of the State to indicate some degree of validity. To be sure there was a larger proportion of the population of the sample in the lower age groups than in the rural population generally, but the birth rate of rural Ross County averaged about four points above the birth rate of rural Ohio. This difference in birth rates was sufficient to account for the differences in age distribution encountered.

In order to get some measure of the economic status of the farmers of the different areas, they were asked the number of acres in the farm, and the number of acres in crops for the year 1925. An animal census was also taken. For comparative purposes these were converted into "animal units" and "work units on crops".[8]

TABLE 19.—Acres in Farm, Number of Families by Areas, Owners and Renters Only

Size of farms	Number of families in each size group of farms				
	Total	Green	Deerfield	Harrison	Huntington
Less than 20 acres	2	0	0	1	1
20—49	14	2	1	8	3
50—99	49	6	8	16	19
100—174	44	17	1	16	10
175—499	40	13	16	2	9
500 and over	2	1	1	0	0
Total	151	39	27	43	42

The size of farms varied with the four areas, as Table 19 shows. The largest farms were in Deerfield, the smallest in Harrison. The average acreages were: Green 151, Deerfield 245, Harrison 90, and Huntington 95. The size of the farms in the Deerfield area explains the large number of farm laborers reported in that area.

The following differences between areas as revealed by the survey are also significant.

TABLE 20.—Occupation and Tenure, Number of Families in Each Group

Group	Number families in each group				
	Total	Green	Deerfield	Harrison	Huntington
Non-farmer	20	2	5	6	7
Farmer	180	48	45	44	43
Owner	102	20	13	36	33
Full	75	13	9	28	25
Part	18	5	3	6	4
Retired	9	2	1	2	4
Renter	49	19	14	7	9
Laborer	29	9	18	1	1
Total	200	50	50	50	50

Table 21 shows that there were more livestock units on the farms of the Green and Deerfield areas than on the farms of the other areas. This is one indication of the size of a farm business and a rough indication of the economic status of the people.

[8]An animal unit is a measure of the amount of livestock in terms of one horse, one cow, or their feed consuming equivalents.

A work unit on crops is a measure of work done on crops in terms of a normal day's labor for one man.

TABLE 21.—Number of Animal Units on Farms of Owners and Renters*

Number animal units per farm	Number of farms				
	Total	Green	Deerfield	Harrison	Huntington
Under 4	24	0	1	17	6
5 and under 10	43	3	4	17	19
10 and under 15	20	6	3	6	5
15 and under 20	15	8	3	0	4
20 and under 30	19	8	7	1	3
30 and over	20	11	8	0	1
No information	1	1	0	0	0
Total farms	142	37	26	41	38

*Exclusive of retired farmers.

The areas as well as occupation and tenure groups differed significantly in percentage of automobile owners. The greatest differences between tenure and occupation groups appeared in Green. Green and Deerfield, the areas with fertile land and good roads, had the greatest percentage of automobile owners. Harrison, the poorest, most hilly and inaccessible area, had the smallest percentage.

TABLE 22.—Number of Work Units on Crops on Farms of Owners and Renters*

Number work units	Number of farms				
	Total	Green	Deerfield	Harrison	Huntington
Under 25	17	1	0	15	1
25 and under 50	15	0	0	13	2
50 and under 100	15	3	0	8	4
100 and under 200	35	6	6	4	19
200 and under 400	33	17	4	1	11
400 and over	26	9	16	0	1
No information	1	1	0	0	0
Total farms	142	37	26	41	38

*Exclusive of retired farmers.

TABLE 23.—Number and Percentage of Families Owning Automobiles, by Occupation and Tenure

Class	Area									
	Total		Green		Deerfield		Harrison		Huntington	
	No.	*Pct.*	*No.*	*Pct.*	*No.*	*Pct.*	*No.*	*Pct.*	*No.*	*Pct.*
Non-farmer	17	85	1	50	4	80	6	100	6	86
Farmer	126	70	42	88	38	84	16	36	30	70
Owner	66	65	20	100	12	92	11	31	23	70
Renter	40	82	17	89	12	86	5	71	6	67
Laborer	20	69	5	56	14	78	0	0	1	100
Total	143	72	43	86	42	84	22	44	36	72

The telephone is another important communication facility for obtaining medical service. Table 24 gives for each area the number of families that had telephones.

TABLE 24.—Number and Percentage of Families Having Telephones, by Area, Occupation, and Tenure

Class	Area									
	Total		Green		Deerfield		Harrison		Huntington	
	No.	*Pct.*	*No.*	*Pct.*	*No.*	*Pct.*	*No.*	*Pct.*	*No.*	*Pct.*
Non-farmer	5	25	1	50	2	40	0	0	2	29
Farmer	68	38	34	71	22	49	1	2	11	25
Owner	38	18	20	100	9	69	0	0	9	27
Renter	27	56	13	68	11	79	1	14	2	22
Laborer	3	10	1	11	2	11	0	0	0	0
Total	73	37	35	70	24	48	1	2	13	26

The areas rank in the same order by percentage having telephones and percentage owning automobiles. However, the number of families who had telephones is much smaller, especially in the hill areas, than of those who had automobiles. Only one telephone was found among the fifty families in the Harrison area.

TABLE 25.—Number of Miles to the Nearest Telephone

Distance	Number of families				
	Total	Green	Deerfield	Harrison	Huntington
Had telephone	73	35	24	1	13
Had no telephone	127	15	26	49	37
Under 1 mile	60	14	24	3	19
1 and under 3 miles	44	1	2	23	18
3 and under 5 miles	15	0	0	15	0
5 miles and over	8	0	0	8	0
Total	200	50	50	50	50

The Harrison area not only lacked telephones but many families lived many miles from the nearest telephone. This was true to a less extent in Huntington. These two areas also had few good roads except during the summer months.

The areas surveyed all had a relatively stable population, at least half of the families had been in the same community 30 years or longer. In the Huntington area 39 of the 50 families had lived there as long as 30 years. Of the entire 200 families in all areas only 7 had resided there less than one year.

TABLE 26.—Size of Family by Area

Number in family	Area				
	Total	Green	Deerfield	Harrison	Huntington
1 person	7	2	0	2	3
2 persons	32	13	5	11	3
3 persons	49	11	16	9	13
4 persons	29	4	8	9	8
5 persons	28	11	5	8	4
6 persons	17	4	4	4	5
7 persons	13	3	4	3	3
8 persons	12	0	5	2	5
9 persons	10	1	1	2	6
10 persons	3	1	2	0	0
Total number of families	200	50	50	50	50
Average per family	4.4	3.9	4.8	4.1	4.9

The average size of the 200 families was 4.4 persons. The families of the Green area averaged smallest (3.9), while those of the Huntington area averaged largest (4.9). In Deerfield the non-farmer and farm laborer groups had large families, comprising nearly 50 percent of the population of the area. The model size family for the four areas was three persons. Laborers and non-farmers had the largest families (4.8), renters next (4.4), and owners smallest (4.2). This order held for all areas except Huntington, where laborers and non-farmers averaged lowest (4.4).

Seven individuals, of whom six were males, lived alone. They were all elderly people, the youngest being 58 and the oldest 80.

2. COMPOSITION OF THE POPULATION

In the 200 families there were 884 persons. Of these 470 were males and 414 were females, or 114 males per 100 females. In the Huntington area there were 149 males per 100 females, Deerfield 124, Green 118, and Harrison 98. There were more males in each area in the 7—21 and the 21 and over age groups. This surplus of males is characteristic of farm population, the proportion for the entire United States in 1920 being 109.1 males per 100 females.

The age distribution of these 884 persons differed fully as much from the age distribution of rural Ohio as the latter differs from the total population of Ohio. Table 28 shows that the percentage of population under 20 was higher and the percentages in the groups 20—44 and 45 and over lower than for the rural population of the State as a whole. Some of this variation may have been due to the accident of small numbers but it was probably due chiefly to the

high birth rate of rural Ross County as compared with the State as a whole (See Table 6) and to the higher rate of migration of adults from these hilly sections.

TABLE 27.—Age and Sex Distribution by Area

Age	Total			Green			Deerfield			Harrison			Huntington		
	M	F	B	M	F	B	M	F	B	M	F	B	M	F	B
Under 5	49	66	115	10	15	25	19	17	36	8	19	27	12	15	27
5—9	60	48	108	11	7	18	18	6	24	11	16	27	20	19	39
10—14	64	53	117	12	7	19	19	14	33	13	13	26	20	19	39
15—19	46	41	87	8	9	17	11	18	29	15	6	21	12	8	20
20—24	36	27	63	9	6	15	12	7	19	7	8	15	8	6	14
25—29	24	26	50	5	7	12	5	11	16	5	2	7	9	6	15
30—34	31	24	55	8	6	14	13	5	18	3	5	8	7	8	15
35—39	24	27	51	11	11	22	4	8	12	5	1	6	4	7	11
40—44	37	19	46	5	4	9	8	5	13	5	6	11	9	4	13
45—49	23	19	42	5	6	11	2	2	4	9	7	16	7	4	11
50—54	20	12	32	6	1	7	6	5	11	3	2	5	5	4	9
55—59	22	16	38	4	2	6	8	3	11	7	8	15	3	3	6
60—64	14	14	28	4	4	8	3	1	4	3	5	8	4	4	8
65—69	11	8	19	3	2	5	2	1	3	2	2	4	4	3	7
70—74	11	8	19	2	2	4	1	2	3	5	2	7	3	2	5
75 and over	8	6	14	3	1	4	0	1	1	1	2	3	4	2	6
Total	470	414	884	106	90	196	131	106	237	102	104	206	131	114	245

The areas were by no means uniform in age distribution. Green, the wealthiest area, possessed a stationary type of population with only 31.6 percent under 15 years of age. The other three areas may be classed as progressive types with the percentage under 15 years varying from 38.8 percent in Harrison to 42.8 percent in Huntington. These three areas also showed the effect of adult migration having only from 40 to 45 percent of the population in the 15—49 age group. This migration was greatest in the two hill sections and among the females. In the Harrison area the percentage of males in the 15—49 age group was 48 while the corresponding percentage for females was only 33.7. This area showed a higher percentage (20.4) of population over 49 than any other.

TABLE 28.—Distribution of Population by Broad Age Groups. Total Ross County and the Total and Rural Population of Ohio Compared

Age	Ross County	Rural Ohio	Total Ohio
All ages	100.0	100.0	100.0
Under 5 years	13.0	10.7	10.2
5—9 years	12.2	10.6	9.5
10—14 years	13.3	10.2	8.8
15—19 years	9.8	8.7	8.1
20—44 years	29.9	33.4	40.1
45 and over	21.8	26.4	23.2
Age unknown	....	.....	0.1

In general, we may say that the figures indicate that the poorer the area the greater the adult migration and that the females leave in larger numbers than the males.

3. EXTENT OF ILLNESS

In discussing the use of health facilities by the farm families surveyed it will be well to keep in mind the nature of our problem. We have already presented a review of the health facilities available to the farm people of Ross County and the conditions of their use. It now remains for us to show to what extent and under what conditions these facilities were used.

It would be highly desirable to have at hand the results of a thoro medical examination of all the persons included in this survey. Such data checked against the use of available health facilities would provide some measure of the health standards of the people mixed with the variable of economic means. It was hoped at the time of the survey that the results of the medical examinations of school children could be used as partial data for this purpose, but this hope was later abandoned. Consequently the only available index of the need of medical and health facilities is that supplied by the statements of the people visited.

TABLE 29.—Number and Percentage of Persons Ill, by Age and Sex

Age	Total			Males			Females		
	In group	Were ill		In group	Were ill		In group	Were ill	
	No.	*No.*	*Pct.*	*No.*	*No.*	*Pct.*	*No.*	*No.*	*Pct.*
Under 10	223	95	43	109	44	40	114	41	36
10—19	204	87	43	110	44	40	94	43	36
20—29	113	47	42	60	14	23	53	33	62
30—39	106	47	44	55	19	35	51	28	55
40—49	98	39	40	50	22	44	38	17	45
50—59	70	31	44	42	15	36	28	16	57
60—69	47	21	45	25	9	36	22	12	55
70 and over	33	21	64	19	13	68	14	8	47
Total	884	378	43	470	180	38	414	198	48

An illness record by individuals for the preceding twelve months was obtained from each family. No attempt was made to interpret the term. The results virtually represent the response to the question "Have you had any sickness in your family during the past twelve months?" Of course the response was in every case conditioned by the family standard of what constitutes "sickness", but it is not here intended to go behind that standard. It was desired to determine what difference existed between the

family record of illness and the use of available medical facilities. This difference should be some measure of the extent to which family standards of health were realized in terms of medical care.

Table 29 indicates that of the total persons surveyed 43 percent had been ill for a greater or less length of time from some cause during the preceding twelve months. A larger percentage of the females were ill than of the males, but part of this difference appears to have been due to childbearing. Pronounced difference between the sexes does not appear until the 20—29 age group. The percentage of males that were ill drops after 20 but that of females increases so that the figures for both sexes remain about uniform thruout the various age groups. Of the various areas, Green reported the highest percentage ill (52), and Deerfield the least (35). Harrison and Huntington each reported 43 percent.

If 43 percent of the people were ill during the year what were the causes of illness? Were many of the cases merely cases of "not feeling good", or were they serious disorders? To what extent did contagious and infectious disease play a part? To what extent were medical facilities used? These and other questions readily occur. Table 30 is a summary of the people's statements as to causes of illness, and the medical or health agencies (including midwives) used therefor. Where a physician had been called, the family was usually able to repeat his diagnosis. In many cases, however, the people either did not know the cause or did not care to tell. This accounts for the large number of ill-defined and unknown cases. Other cases, altho the cause was ill-defined, could be placed in their general group with reasonable certainty. The International List of Causes of Sickness and Death (revision of 1920) was used in preparing the table. While absolute accuracy is not claimed for the table the authors believe it to be fairly dependable in most cases.

It will be noted that the chief causes of illness were mumps, colds and grippe, accidents, childbirth, whooping cough, chronic rheumatism, influenza, and indigestion, to name the first eight. The epidemic-infectious group gave most cases, the respiratory group second, and the digestive group third.

Just 72 percent of these cases called into use some medical resource outside the family. This percentage of course varied greatly among the causes of illness. Thus accidents were practically all treated by a physician, but mumps was seldom so treated. It is clear, not only that there was considerable illness during the twelvemonth but also that the medical resources of the county were utilized.

Both careful medical attention and flagrant neglect can easily be illustrated, tho cases of the former usually came from the Green area. An example of each extreme may be cited:

A family of five spent $631 for health purposes during the year. This included an operation for appendicitis and complications. Physicians' services cost $308, hospital and nursing care $248, dental service $60, and optical service $15.

TABLE 30.—Number of Persons Ill and Number Receiving Care From Medical or Health Agencies

Cause of illness	Persons ill	Received care	
	No.	*No.*	*Pct.*
Endemic, Epidemic, and Infectious Diseases (1-42)	130	47	36
Mumps	74	10	
Whooping Cough	19	7	
Influenza	16	10	
Paratyphoid	9	9	
Tuberculosis	6	5	
Diphtheria	3	3	
Miscellaneous	3	3	
General Diseases not Included above (43-69)	27	23	85
Chronic Rheumatism	18	15	
Lumbago	3	3	
Miscellaneous	6	5	
Diseases of the Nervous System (70-86)	19	12	63
Ear	5	2	
Neuritis and Neuralgia	4	4	
Paralysis	4	2	
"Nervousness"	3	2	
Miscellaneous	3	2	
Diseases of the Circulatory System (87-96)	5	5	
"Heart Trouble"	4	4	
High Blood Pressure	1	1	
Diseases of the Respiratory System (97-107)	57	53	93
Colds and Grippe	43	39	
Pneumonia	6	6	
Pleurisy	4	4	
Miscellaneous	4	4	
Diseases of the Digestive System (108-127)	52	44	84
Indigestion	16	12	
Tonsils	10	9	
Diarrhea and Enteritis	8	5	
"Stomach Trouble"	6	6	
Teeth	3	3	
Miscellaneous	9	9	
Non-Venereal Diseases of the Genito-Urinary System and Annexa (128-142)	2	2	
The Puerperal State (143-150)	27	24	89
Childbirth	25	22	
Following Childbirth	2	2	
Diseases of the Skin and Cellular Tissue (151-155)	9	8	89
Acute Abscess	3	3	
Miscellaneous	6	5	
Diseases of Early Infancy (160-163)	1	0	
External Causes (165-203)	26	25	96
Traumatisms	22	22	
Miscellaneous	4	3	
Ill-defined or Unknown	49	47	96
Total	403	290	72

A family of nine, the seven children ranging from 7 months to 13 years of age, spent $31 during the year. Seven members had had mumps, the baby had sores on legs, one child was congenitally defective, the father looked tubercular, and the entire family evidently was undernourished. During the year the father made an office call which cost $1 and a physician attended the mother at childbirth, which cost $30. This was the extent of their medical care.

4. TOTAL EXPENDITURE FOR HEALTH

A careful survey was made of all expenditures for health purposes during the year. Table 31 shows that much variation existed both as to area and type of service. In lieu of a better distinction the term "legitimate" has been used to set off expenditures for specialized health agencies from expenditures for unprescribed drugs and remedies. By the use of this term it is not meant to infer that there is no health merit in the latter group of expenditures. There exists common knowledge of certain well-known remedies which when used are included in this group. However, it is believed that most of the money spent for unprescribed drugs and remedies went for patent medicines and nostrums of many varieties. Several lines of evidence contribute to this belief. Families freely admitted using patent medicines, and tho they were often reluctant

TABLE 31.—Health Expenditure of 200 Families, Distributed by Area and Type of Service

Type of service	Total	Green	Deerfield	Harrison	Huntington
Amounts spent, dollars					
All services	7,850.40	3,502.55	1,777.10	1,118.25	1,352.50
Unprescribed drugs and remedies	1,454.50	330.00	337.50	479.00	308.00
Legitimate service	6,395.90	3,172.55	1,439.60	639.25	1,044.50
Physicians	4,113.35	1,921.75	1,078.85	443.75	669.00
Dental	1,123.00	348.50	368.50	182.00	224.00
Nursing	423.00	357.00	*	0	66.00
Hospital	377.25	372.25	*	0	5.00
Optical	319.05	173.05	53.50	13.50	79.00
Dispensary	40.25	0	38.75	0	1.50
Distribution, percent					
All services	100.0	100.0	100.0	100.0	100.0
Unprescribed drugs and remedies	18.5	9.4	19.0	42.8	22.8
Legitimate service	81.5	90.6	81.0	57.2	77.2
Legitimate service	100.0	100.0	100.0	100.0	100.0
Physicians	64.3	60.6	70.1	69.4	64.0
Dental	17.6	11.0	23.9	28.5	21.4
Nursing	6.6	11.3	*	0	6.3
Hospital	5.9	11.7	*	0	0.5
Optical	5.0	5.4	3.5	2.1	7.6
Dispensary	0.6	0	2.5	0	0.2

*One case only, costs unknown.

to name the kind, many varieties were collected by the investigators. Table 32 shows that very little money was spent for prescribed dispensary service. Physicians serving these country districts, as a rule, dispensed their own medicines. Certain patent medicine venders regularly visited this territory. The attitude of antagonism and distrust toward physicians in general, found particularly in the more backward areas and among the poorer families, made these families easy prey for such salesmen.

So far as area is concerned the expenditure for unprescribed remedies decreased as the expenditure for legitimate medical service increased. In the Green area only 9.4 percent of the health budget went for unprescribed remedies, while in Harrison, the most backward area, 42.8 percent of the budget was for such remedies. An attempted correlation between these two expenditures on the family basis shows no such inverse relation however.

TABLE 32.—Expenditure for Unprescribed Drugs and Remedies, by Families

Expenditure, dollars	Number in each expenditure group				
	Total	Green	Deerfield	Harrison	Huntington
Nothing	9	4	1	2	2
Under 5	91	20	22	23	26
5—9	51	16	14	10	11
10—19	27	4	8	8	7
20—29	16	5	4	5	2
30 and over	6	1	1	2	2
Total	200	50	50	50	50
Mean	7.31	6.73	6.75	9.58	6.16
Median	5.00	5.31	5.71	5.00	4.92

It is altogether probable that these differences in area are due to differences in both economic status and the tenacity of neighborhood custom and tradition as opposed to scientific knowledge of the nature of disease. The backward areas are less educated and know less of the modern conceptions of disease. Their low economic status not only prohibits extended use of specialized medical agencies but when used at all makes the expense seem so unreasonably high as to develop an attitude of antagonism which drives the people back upon their customary magical interpretations of disease. In this state of mind they fall easy prey to the patent medicine salesmen who frequent the area.

Table 32 shows the frequency distribution of expenditure for unprescribed remedies by expenditure groups. It will be seen that more than 10 percent of the families spent $20 or more during the

year. One family spent more than $100 for patent medicines for a tuberculous member and $10 for a physician. Patent remedies for "rheumatism" were much in use.

A study of the use which farm families made of the legitimate health facilities in Ross County requires a more detailed analysis of expenditures for these purposes.

By far the largest single item of expenditure was for physicians' services. This item amounted to more than one-half of the total expenditure, and 64.3 percent of the expenditure for legitimate medical service. These ratios hold approximately true for all areas except Harrison where the cost of physicians' services was less than that for drugs and medicines.

Expenditure for dental services was the second largest item, tho in the Green area it was slightly exceeded by both nursing and hospital service.

TABLE 33.—Expenditure for Legitimate Health Service, by Families

Expenditure, dollars	Number of families in each expenditure group				
	Total	Green	Deerfield	Harrison	Huntington
Nothing	40	9	8	10	13
Under 10	46	9	14	16	7
10—19	32	4	1	14	13
20—29	32	7	11	5	9
30—49	16	5	6	3	2
50—74	12	5	4	1	2
75—99	8	1	3	1	3
100—149	6	3	2	0	1
150—199	4	3	1	0	0
200 and over	4	4	0	0	0
All families	200	50	50	50	50
Median	$14.37	$24.30	$21.80	$9.38	$13.70
Average					
Per family	31.98	63.45	30.79	12.78	20.89
Per person	7.20	16.10	6.42	3.10	4.26

Table 33 shows the frequency distribution of all expenditures for legitimate health services. One-fifth of the families had no such expenditure. The better the economic standing of the area the greater was the number of families expending large sums for health purposes. There was also a slight decrease in the number of families having little or no health expense. The effect of these changes is to increase the distance between the median and the average. Better economic conditions both raise the general level of expenditure (the median was higher in the better areas) and widen the extremes by increasing the upper limits of expenditure.

The low expenditure in the poorer areas (Harrison and Huntington) was due to less service rather than to lower cost of service. Because of greater distance the people of the Huntington area paid a higher charge for a given service, particularly for a physician, than the people of the Harrison area.

5. EXPENDITURE FOR PHYSICIANS' SERVICE

Of the 200 families visited 60 did not use a physician in any way during the year, and 55 had less than $10 physicians' fees, leaving less than one-half of the group with costs for physicians of more than $10. This distribution varied with the area, however. Thirteen families in Green had more than $50 expense for physicians; in Deerfield there were but 7, in Harrison none, and in Huntington three. Further analysis of the data shows that 60 percent of the total cost of physicians' service was borne by 20 families; the remaining 40 percent of the cost was borne by 180 families. Thus it will be seen that the costs for medical service in one year were not very well distributed thru the group. A few families had from $100 to $500 expense, while the majority had little or no expense. Due to the heavy expense of a few families, Green shows more concentration of the costs than the other areas. Harrison shows the most even distribution of costs.

TABLE 34.—Expenditure for Physicians' Service, by Families

Expenditure, dollars	Number of families in each expenditure group				
	Total	Green	Deerfield	Harrison	Huntington
None	60	16	12	13	19
Under 10	55	8	16	20	11
10—19	30	6	3	12	9
20—29	19	5	8	2	4
30—49	12	2	4	2	4
50—74	12	7	3	1	1
75—99	3	0	1	0	2
100—149	4	1	3	0	0
150—199	4	4	0	0	0
200 and over	1	1	0	0	0
Total families	200	50	50	50	50
Median	$7.27	$11.67	$7.22	$6.00	$5.45
Average					
Per family	20.57	38.43	21.58	8.88	13.38
Per person	4.65	9.80	4.55	2.15	2.73

The relation of the total expenditure for physicians' service to the total expenditure for all health service is such as to suggest that the percentage the former is of the latter is inversely proportional to the economic standing of the group. Thus, the Deerfield and

Harrison areas spent 70 percent of their total for physicians' service, while Huntington spent 64 percent and Green 61 percent. The same relationship is borne out when the data for the more economically differentiated areas are analyzed by economic class. Farm owners in the wealthy Green area spent 47 percent of their total health expenditure for physicians' service, while renters spent 83 percent and laborers and non-farmers 92 percent. The differentiation was less evident in the Deerfield area and did not hold for the two poorer areas. In these areas owners and renters were very similar in economic status so far as available cash was concerned.

TABLE 35.—Average Cost of Physicians' Service per Family by Occupation and Tenure Groups

Class	Area				
	Total	Green	Deerfield	Harrison	Huntington
All families	$20.57	$38.43	$21.58	$8.88	$13.38
Farm owners	21.17	48.69	34.97	8.89	12.97
Farm renters	22.26	35.15	11.36	8.18	16.28
Farm laborers and non-farmers	17.60	21.91	20.18	9.50	11.44

While the data at hand are too meager to insure proof, there are reasons for the belief that there was a relationship between the economic standing of the family and the amount of medical service obtained in addition to that of the physician. The poorer families made use of only those facilities which they were forced thru dire necessity to use. This usually meant the physician. Families higher in the economic scale not only used the physician more frequently but in addition they employed the dentist, hospital, nurse, and optical service.

One of the chief factors of variation in the cost of physicians' service was distance (See page 18, also Table 36). Table 36 shows what the people paid in relation to the distances traveled by the physicians.

TABLE 36.—Number and Cost of Visits in Relation to Distance From Physician

Item	Area				
	Total	Green	Deerfield	Harrison	Huntington
Families, number	200	50	50	50	50
Visits, number	332	150	82	65	35
Total cost of visits, dollars	1,374.50	657.50	342.50	174.50	200.00
Average cost per visit, dollars	4.14	4.38	4.18	2.68	5.71
Cost per mile,* dollars	0.84	1.29	1.27	0.52	0.75
Miles to nearest physician, av. number	4.9	3.4	3.3	5.2	7.6

*Average cost per visit divided by average number miles to nearest physician.

The average cost of visits to the home was $4.14 and the average distance to the nearest physician 4.9 miles, making the average cost per mile $0.84. The Green and Deerfield areas were more favorably situated for reaching the doctor than the other two areas, and being better able to pay they not only used him oftener but were charged a higher rate for the service. The actual average cost per mile in the Deerfield area was no doubt slightly lower than the figure due to the larger number of families in that area who used other than the nearest physician.

The distances to a physician in the Harrison and Huntington areas were much greater. Some families in the Huntington area were as much as 12 miles from a doctor. Because of the distance this area usually called the nearest doctor, hence, the cost per mile is very nearly a true figure in this case. The cost per mile in the Harrison area was lowest, partly because of the low capacity to pay and partly because much of the work in that area was done by two country physicians at Gillispieville who had not raised their fee scale to the level of many others, particularly the Chillicothe physicians who served the Huntington area. Huntington, therefore, paid highest per visit tho the cost per mile was below the average for the county.

These figures also serve to verify the earlier conclusion that the physicians did not adhere to their fee scale. Chillicothe physicians claimed to charge $1 per mile for rural visits. Since they did nearly all of the work in the Huntington area, the average cost per mile should have been about $1 instead of 75 cents, making the cost of a visit about $7. In the wealthier areas the cost per mile more nearly agreed with the fee scales of the physicians involved. Clearly, it was as the medical men themselves said, they varied their fees with the supposed economic standing of the family, most of the variation being something less than their fee scale.

TABLE 37.—Number and Cost of Office Calls

Office calls	Total	Green	Deerfield	Harrison	Huntington
Number.....	1174	574	135	315	150
Total cost, dollars.....	1225.85	522.75	301.35	195.25	206.50
Average cost, dollars..	1.04	0.91	2.23	0.62	1.38

The apparent inverse relation between number of visits and average number of miles to the nearest physicians suggests a negative correlation between number of visits and distance to the physician. The slight negative correlation for the groups, however, is

not borne out on the family basis. The data at hand are limited and there were many other factors, which played a part in determining the number of visits.

Except for the Green area, the number of office calls did not bear the same relation to the areas as the number of visits. Harrison had a large number at a low average cost because they usually visited the two country doctors at Gillispieville. From the total number of visits and office calls it is evident that the people of the Huntington area received less service from physicians than those of any other area. This appears to be due in the main to the distance to a physician entailing a high cost per visit, and to the fact that Chillicothe physicians, whose fee scales are pretty high for the economic capacities of the people of this area, had to be used.

The differences in the average cost of office calls illustrate the differences in fee scales of the physicians serving the different areas, tho, to be sure, the nature of the calls is involved.

For the whole the average cost of an office call was 25 percent of the cost of a visit, and there were 28 percent as many visits as office calls. These ratios were quite uniform for all groups except Deerfield where the office call averaged 53 percent of the cost of a visit, and there were 61 percent as many visits as office calls. A tendency to accept the cheaper form of service prevailed, and possibly the variation mentioned is an indication that the type of service chosen was determined in part by the ratio of the average cost of one type of service to the average cost of the other.

TABLE 38.—The Family Doctor

Families having—	Total	Green	Deerfield	Harrison	Huntington
No family doctor.....	17	5	4	1	7
The nearest doctor...	145	37	32	36	40
Not the nearest doctor.	38	8	14	13	3
Total families.....	200	50	50	50	50

Table 38 indicates to what extent these country people employed the services of a certain physician regularly and to what extent they depended upon getting whomsoever they could. Only 17, or 8.5 percent, of the families had no family doctor. Seven of them were in the Huntington area where a physician was called only when badly needed making it imperative to take whatever doctor could go. On the other hand, the family doctor of 38, (19 percent) of the families was not the nearest doctor. However, natural circumstances accounted in part for this number. The Deerfield area

is located between the village of Clarksburg, which had one doctor, and Frankfort, which had three. Consequently necessity no doubt caused some of these families to choose a Frankfort physician tho the distance is greater than to Clarksburg.

In some cases a family physician who had moved away was still employed in the locality. Many families in the Harrison area named a certain Chillicothe physician as their family doctor. He had once practiced at Mooresville, near the area, and when wanted still made calls into the area regardless of weather or road conditions, and at a rate much below the fee scales of other Chillicothe physicians.

Children were born into 26 of the 200 families during the preceding twelve months. Of these births, 5 were in Green, 9 in Deerfield, 7 in Huntington, and 5 in the Harrison area. One birth in Harrison and one in Deerfield had no attendance, one in Harrison was attended by a midwife, and in one case the cost was not known. The remaining 22 births were attended by physicians. The costs of attendance were as follows:

TABLE 39.—Cost of Attendance at Childbirth

Area	Range	Average
Green	$12.50—$45.00	$24.62
Deerfield	20 00— 25.00	23.75
Harrison*	15.00— 25.00	21.67
Huntington	15.00— 50.00	27.85
Total	$12.50—$50.00	$25.11

*Cost of one delivery by midwife was $5.00.

These figures include the entire cost incurred in all cases with one exception. One child in the Green area was born in the Chillicothe General Hospital. The total expense of this case was $237.25, including nursing and hospital expense. The remainder of the births incurred no expense except for the physician's charge for delivery. He made no additional visits to the home either before or after the birth.

Difficulty in getting a physician was reported by 28 families; 13 of these were in Huntington, 9 in Harrison, 2 in Deerfield, and 4 in the Green area. The large number in Huntington was due largely to the extreme distance that many of the families lived from the nearest physician—21 of the 50 families lived more than eight miles from the nearest physician and many of these had no telephone—and to the impassible condition of the roads in this area during the

winter months, Chillicothe physicians did not like to make a call over this distance when it had to be made by means other than motor transportation. When the roads were bad they would not make a night visit, even for their regular clientele, except under the most extreme circumstances.

In the other areas most of the difficulties in getting a physician could be traced to the fact that the families complaining were not prompt in paying their bills. This was especially true in the Green and Deerfield areas. In Harrison the condition of the roads and the age of the physicians serving the area were in part the explanation. One of the physicians would not make a night visit unless the family called for him and took him to the home. Since there were few telephones available in this area the problem of getting a physician in emergencies was difficult. During the winter months someone had to travel to the nearest physician and bring him to the home by means of a horse drawn vehicle.

A number of families reported difficulty in getting a physician because of poor telephone service.

6. EXPENDITURE FOR DENTAL SERVICE

Expenditure for dental work amounted to 17.6 percent of the total expenditure for legitimate health service among these 200 families. The dental item appeared to decline in percentage, if not in amount, as the economic standing of the area raised—more being spent for hospital, nurse, and optical work—while the doctors' item remained about the same. Both the percentage of families having dental work done and the average amount spent per family varied

TABLE 40.—Expenditure for Dental Service, by Economic Class

Class	Total	Green	Deerfield	Harrison	Huntington
All					
Total families, number	200	50	50	50	50
Had dental work, number	89	26	28	20	15
Total cost, dollars	1123.00	348.50	368.25	182.00	224.00
Average cost, dollars	5.62	6.97	7.37	3.64	4.48
Owners					
Total families, number	102	20	13	36	33
Had dental work, number	47	16	10	12	9
Total cost, dollars	756.75	287.50	173.75	127.50	163.00
Average cost, dollars	7.42	14.38	13.78	3.54	4.94
Renters					
Total families, number	49	19	14	7	9
Had dental work, number	26	6	10	5	5
Total cost, dollars	225.00	56.50	97.50	28.00	43.00
Average cost, dollars	4.59	2.97	6.90	4.00	4.78
Laborers and others					
Total families, number	49	11	23	7	8
Had dental work, number	16	4	8	3	1
Total cost, dollars	141 00	4 50	92 00	26.50	18.00
Average cost, dollars	2.80	0.41	4.00	3.79	2.25

inversely with economic standing. This was true of both the areas and of the economic classes within the Green area where economic differentiation had proceeded far enough to make sharp distinctions in both economic and social affairs. Such was not the case in the other areas, except in the case of the owners in Deerfield who are a distinctly differentiated class.

The data at hand as well as field observations indicate that dental work in these districts was mainly a matter of relieving an aching tooth. Some constructive work was done among the more wealthy families of the better areas.

7. EXPENDITURE FOR HOSPITAL AND NURSING SERVICE

Little money was expended for hospital and nursing service. A total of 6 families, four of which lived in the Green area, had spent an average of $62.87 each for hospital service; 1 family in the Huntington area had had a $5 hospital bill; and 1 in the Deerfield area the expenditure of which was not obtained.

A total of 7 families—5 in the Green area, 1 in the Huntington area, and 1 in the Deerfield area, had employed some nursing service and for this service they had paid an average of $60.43 per family.

These types of service were used only in cases of extreme necessity, and outside the Green area a registered nurse was very rarely employed.

8. EXPENDITURE FOR OPTICAL SERVICE

A total of $319.05 was spent for optical service. Of this amount, $288.00 was spent by farm owners while the remaining $31.05 was distributed among the other groups. The farm-owner group in each area received practically all of the optical service rendered. Green had the largest bill, $173.05, and Harrison the smallest, $13.50. As in the case of dental service, the amount and cost of optical work done was in direct proportion to the economic standing of the group. This was true among the areas and among groups within an area.

IV. FACTORS OF VARIABILITY IN THE USE OF THESE FACILITIES

1. EXTENT OF ILLNESS

Without doubt the amount of illness in the family should be taken as a variable which conditions the use made of medical and health agencies. Not having at hand any standard, objective determination of the extent of illness occurring in these 200 families, it is not possible to correlate this factor with the use made of

health facilities. The illness record, Table 30, shows that the Green area reported 111 cases of illness and that a physician saw 86 percent of them. Deerfield reported 83 cases and a physician saw 76 percent of them; Harrison, 88 cases and 85 percent; Huntington, 122 cases and 47 percent. The Green area not only reported the highest percentage of persons ill (52 percent) but also the highest percentage of those ill receiving medical care. The higher percentage of illness probably should be taken both as a reflection of the actual amount of illness and the notion of the people as to what constitutes an "illness". It is impossible to say how much more closely the illness record supplied by the people of the Green area than those supplied by the other areas approximated the actual condition. However a much higher morbidity for colds and grippe, indigestion, and accidents was reported by the Green area. In the case of the two hill areas the large number of vague and ill defined reports as to the cause of illness suggests ignorance resulting from seldom having a physician in attendance and hazy thinking as to what constitutes an illness. People who are not in the habit of safeguarding their health may feel badly for a time, but not knowing the cause they give it little thought and readily forget the incident after pain leaves.

But this tells us nothing of the nature of the cases of illness. Some cases required the services of a physician, others did not. Further analysis shows that Huntington had 60 cases of mumps and a doctor saw 4 of them; Deerfield had 10 and a doctor saw 3. The reported accidents of all areas were taken to a doctor. The doctor was generally used for colds and grippe but not so frequently for influenza. Green reported 7 cases of whooping cough, 4 of which had medical service; Deerfield reported 7 cases, 3 of which had medical service; Harrison 1, without medical attention; and Huntington 4, all without medical attention. But even these instances do not give a clear understanding of the situation for nothing is known of the comparative seriousness of the various cases of the same disease. It is clear that what we have before us is not extent of illness objectively determined but the people's notion of the extent of their illness, and altho the latter may differ considerably from the former it is this notion that prompts people to call a doctor.

That the health standards differed by areas cannot be doubted any more than that the health practices differed by areas. Standards do not continue indefinitely to far outrun practices. In all areas the cases of illness in which the causes indicated that the

patients were either violently or alarmingly ill, as pneumonia and the like, were quite generally attended by physicians. It was in the cases, such as colds and mumps, in which the patient was not generally violently ill, and in those, such as whooping cough, regarding which tradition has decreed that there is no cause for alarm, that marked area differences appeared. Here superior standards were not only reflected in obtaining the services of a physician for such "minor" ailments but in designating them as cases of illness when inferior standards would fail to report them. Hence, we may say that the health standards of the people indicated differences in the degree of illness in the various areas surveyed and that these morbidity differences were reflected in the extent to which the people used the available medical facilities.

2. DISTANCE

So far as the data are concerned the factor of distance operated chiefly to cause variation in the use made of physicians. The distance from a hospital was approximately the same in the various areas studied and the measure of hospital use was dire necessity under doctor's orders. The hospital, like the nurse, was used very little. Distance may have affected the use of the dentist, but the whole of that service was too slight to determine significant trends.

The service of the physician was sufficiently general and the distance factor sufficiently variable to show significant results. The relation between distance to the nearest physician and the number of calls, as shown on page 38, was close. It was too close to be accounted for on the basis of the differences in illness reported. The Green and Deerfield areas were equally near to physicians and paid about the same charge per visit. With different morbidity rates the difference in percentage of cases having medical care was not so great as might be expected from the comparative wealth and composition of the population of the two areas. On the other hand, the Harrison area, farther from physicians but receiving the low priced service of two nearby country doctors, used an unexpectedly large amount of medical service in view of the poverty of the area, an amount which would be quite improbable were the people served by more distant or highly trained physicians. The Huntington area alone was the victim of both distance and high fees, being forced to use Chillicothe physicians. The low percentage of cases having medical care was no doubt very largely the result of this condition.

The comparative ease of obtaining a physician, due to telephone service and condition of roads, was also a kind of distance factor. In the Harrison area meager telephone service did not appear to markedly decrease the extent of medical service. The doctor was called only in cases of necessity. The country doctors employed were used to the roads. The people commonly went for the doctor and waited until he could be obtained. Of course all this greatly delayed the visit. The road factor operated to raise the cost per visit, especially if the urban physician was used, and increased the ratio of office calls to home visits.

The factor of distance, then, operated to raise the cost of medical service, and tho physicians did not adhere strictly to their fee scale where long distances were involved, such reduction was not sufficient to prevent a considerable decrease in the use of medical service, particularly where the people were not wealthy and where the physicians employed standard fees.

3. ABILITY TO PAY

No completely satisfactory measure of the economic standing of the 200 families surveyed is at hand. There were, however, obvious differences between the areas. As measured by value and utility of land, buildings, and farm equipment, and extent of such conveniences as automobiles and telephones the Green area ranked first; the Deerfield, second (not because of the land factor but because of the number of tenants and laborers); the Huntington, third; and the Harrison, poorest. It was in this order that amounts were spent by the respective groups for all purposes, for legitimate health service, and for physicians' service.

The two poorest areas had but one family that spent more than $100 for legitimate health service. The wealthiest area alone had ten such families.

In the case of the economic classes, owners and renters, there was a sharp distinction in amounts spent in the two wealthier areas. In the two poorer areas there was no appreciable difference in amounts spent by these classes. In these areas owners and renters were much nearer the same economic level than in the wealthier areas and no doubt custom played a part in keeping practice uniform.

It would appear that where marked economic differences had prevailed for a sufficient period of time these differences had become the basis of social classes which became differentiated also in regard to such consumption standards and practices as health and

medical service. Where economic differences were less pronounced and the people had not become conscious of them, in lieu of other divisive factors such as race, for example, such unifying factors as custom and convention tended to keep prevailing standards and practices relatively uniform.

On a purely family basis adequate statistical evidence of the relation of medical service and ability to pay was lacking. After having made the field studies and compiled the data, however, the general conclusion seems unavoidable that the poor tended to get what medical service appeared to be necessary to keep them alive, tho they frequently relied on patent medicines instead, and that the optional care which might be in any way construed as preventive was obtained only by the economically well-to-do. Truly preventive medicine was practically unknown in any of these areas.

4. SEX

As pointed out on page 32, while the percentage of illness reported for both sexes remained about constant for the various age groups, after the age of twenty the amount of illness among the males decreased and among the females increased, the difference prevailing until after seventy years and reaching a maximum of 39 percent during the period of 20—29 years of age. The average difference in illness between the sexes was 10 percent. Curiously enough when the percentages of persons that used some health facility (medical, dental, optical, hospital, or nursing) during the year, are classified by age and sex, as in Table 41, the sex difference is again 10 percent. A higher percentage of males than of females under 10 years received attention, however, and the differences in

TABLE 41.—Number and Percentage of Persons Using Health Facilities, by Age and Sex

Age	Total			Male			Female		
	In group	Used facilities		In group	Used facilities		In group	Used facilities	
	No.	*No.*	*Pct.*	*No.*	*No.*	*Pct.*	*No.*	*No.*	*Pct.*
Under 10	223	47	21	109	28	26	114	19	17
10—19	204	70	34	110	34	31	94	36	38
20—29	113	63	56	60	23	38	53	40	76
30—39	106	61	58	55	25	45	51	36	71
40—49	88	46	52	50	24	48	38	22	58
50—59	70	37	53	42	17	40	28	20	71
60—69	47	16	34	25	6	24	22	10	45
70 and over	33	20	59	19	13	68	14	7	50
Total	884	360	41	470	170	36	414	190	46

favor of females after the age of 30 averaged seven points greater than the sex differences in the case of illness reported.

Sex difference was greatest in the age group 20—29 years where 38 percent more of the females used some medical or health agency than males. After the age of 60 there was little sex difference.

These differences held with only slight variations for the respective areas, except that in the case of Harrison only 10 percent more females than males received care in the 20—29 age group. This is the area in which least medical service was obtained for maternity cases.

5. AGE

Table 41 presents evidence which points to age as a factor involved in the variation in the use of health agencies. Some professional health service during the year was received by 41 percent of the 884 persons covered by the survey, but the percentage was by no means equal for the various age groups. Persons under 20 years of age and between 60 and 69 years fell below the average. The older group was a comparatively small group. Only 21 percent of the children under 10 years of age received some care. In all areas they received less than the average, tho in Green their average was about 30 percent. In the Huntington area but 13 percent of the males and 9 percent of the females received any care, yet this was an area of many children and considerable illness. More than the average percentage of persons in the adult age groups received care, yet it should be borne in mind that the amount of illness reported was fairly uniform thruout the various age groups. Further, the variation held for both sexes, tho of course allowance must be made for the high percentage of females receiving medical service during the childbearing ages.

Apparently the tentative conclusion may be drawn from these data that as age increases from childhood to middle age the percentage of persons receiving some professional medical or health service also increases. After middle age the tendency is less pronounced. If this be true the reasons therefore can only be conjectured here. The decision as to whether medical or other health aid will be obtained rests in any case with adults. Children may be ill without complaining much, or it may be thought that they will outgrow the malady or that they have only a children's disease which every child should have and for the treatment of which home remedies will suffice. Adults may be more alarmed at pain within

themselves than in their children and the knowledge that they are advancing in years to where an acute illness may easily become a serious matter may hasten their decision to visit a physician. Many chronic ailments were encountered among the adults and possibly after these persons had once been examined by a physician and warned by him it became easier to return to him. It is altogether likely, however, that many of these adults were suffering from chronic ailments as a result of the same neglect from their parents as they were meting out to their own children.

6. SIZE OF FAMILY

The influence of the size of family upon the use of medical and health agencies is an interesting and important one. It is to be regretted that data on a larger number of families are not available for the study of this point. Table 42 shows the distribution of the 884 persons included in the survey according to the size of family in which they lived, and the percentage of these persons receiving some professional health service during the year. The number of individuals living alone was too small to be significant. Among the larger families there appears to be a decided decrease in the probability of a member receiving any health service from outside the family as compared with those in smaller families. This difference can not be due to the possibility of a physician serving a large family at a proportionately lower cost than a small one, for the factor of cost was not involved in these particular data. The factor of area affected the percentages for families of 8 and 9 persons as these two groups were slightly weighted in favor of the Huntington area where medical services were difficult to obtain, but not all of the difference in these two groups can be charged to area, and the other groups were fairly well distributed thruout the areas.

TABLE 42.—Persons Using Health Agencies, by Size of Family

Size of family	Persons in group	Number using agencies	Percent using agencies
1 person	7	3	43
2 persons	64	34	53
3 persons	147	63	43
4 persons	116	58	50
5 persons	140	70	50
6 persons	102	36	35
7 persons	91	33	36
8 persons	96	28	29
9 persons	90	20	22
10 persons	31	15	48
Total	884	360	41

Table 42 includes all families covered by the survey whether they used health agencies or not. Dividing the families into two groups, those who used health agencies and those who did not use them, we find 160 families including 534 persons in the first group and 40 families including 350 persons in the second group. The average size of the 160 families that used health agencies was 4.6 persons, while the average size of the 40 families that did not was 3.8 persons. This and the percentages of families of each size group using health agencies, as shown in Table 43, make it clear that in a large family the probability of some member requiring the services of a health agency was greater than in a small family. This is what normally should be expected. But if the data in Table 42 be of general application, the chances of any particular person receiving care from a health agency varies somewhat inversely with the size of family of which he is a member.

TABLE 43.—Families Using Health Agencies, by Size of Family

Size of family	Total families	Did not use agencies	Used agencies	
	No.	*No.*	*No.*	*Pct.*
1 person	7	4	3	43
2 persons	32	9	23	72
3 persons	49	12	37	76
4 persons	29	2	27	83
5 persons	28	5	23	82
6 persons	17	3	14	82
7 persons	13	1	12	92
8 persons	12	2	10	83
9 persons	10	2	8	80
10 persons	3	0	3	100
Total families	200	40	160	80
Av. size family	4.4	3.8	4.6	.....
Median size family	3.0	3.0	4.0	.....

If this be true there are possibly several factors involved. One of these is age. The correlation between age of individuals and size of family was only .24 ± .034. But this does not disclose the true situation. As a matter of fact there are two age distributions involved, that of parents and that of children. In this study, contrary to what might be supposed, the mean age of heads of families did not increase with the size of family, due to the fact that the "heads of families" group was composed of two subgroups: the younger parents whose families were continuing to increase in number and the older parents whose families were decreasing due to adult children leaving home.[9] In fact there was an inverse correlation of —.261 ± .045 between the mean age of female heads of families and size of family.

[9]The survey included only those persons living in the respective areas at that time.

The significant fact with regard to age, however, is that the heads of families are adults and most of the remaining members of these families were children. It is clear from Table 41, that a smaller percentage of children under 10 years of age received some service from professional, medical, and health agencies than any other age group. While the percentage for children between the ages of 10 and 20 was higher they still received proportionately much less such service than adults. Consequently, since families increase in size chiefly by the addition of more children, it is not surprising that in the larger families there was a decrease in the percentage of persons receiving service.

TABLE 44.—Heads of Families and Children Under 20 Years of Age Using Health Agencies, by Size of Family

Size of family	Heads of families			Children under 20 years		
	Number in group	Number using agencies	Percent	Number in group	Number using agencies	Percent
2 persons	57	32	56	5	2	40
3 persons	91	43	47	33	10	30
4 persons	57	37	65	45	13	29
5 persons	54	36	67	75	30	40
6 persons	43	24	56	57	9	16
7 persons	25	10	40	63	16	25
8 persons	24	11	46	63	14	22
9 persons	20	9	45	64	8	13
10 persons	5	3	60	22	9	41
Total	376	205	55	427	111	26

An important question at once arises. Was the relative decrease in the use of medical and health agencies by large families due to this difference in age composition and social status of parents and children or was there an actual difference in standards of practice which was reflected in the health service received by either parents or children or both? It will be seen from Table 44, which shows the percentages of heads of families and children under 20 years of age using health agencies, that in the larger families a smaller proportion of both family heads and children received the service of health agencies than in smaller families. The trend, however, was clearer in the case of children than of family heads. It is apparent from these data that the members of large families received relatively less service from professional medical and health agencies than the members of small families. The age composition of the family furnishes a partial explanation but it is not sufficient to account fully for the differences in service noted.

A second possible explanation of the seeming fact that the large family used proportionately fewer health agencies than the smaller family is that increase in ability to pay did not keep pace with size of family. Enough is known of human nature to make it certain that probable economic consequences do not govern the birth rate. It may be that in Ross County large families and poor economic status were associated conditions. Again there is no satisfactory measure of the economic status of the families surveyed. It was found that on the farms the number of animal units and the number of work units in crops were rather closely correlated. These may be taken as a rough measure of the size of the farm business but not as a measure of its profits. The correlation between size of family and work units in crops was $.167 \pm .055$. It is very likely that there was no close correlation between size of family and ability to pay.

Another possible explanation is that the means available for paying for the service of medical and health agencies, in the case of large families, was exhausted in bearing the cost of childbirth, leaving the whole family less well cared for in matters pertaining to health and welfare.

Of course it is possible that we are looking too far afield for the explanation. Possibly the large families were healthier than the small ones and needed less professional attention. On the whole, however, if the large families in question were not hampered by limited ability to pay, if they did not possess inferior standards of health and welfare, and if their more limited use of medical and health agencies actually represented a more limited need than was the case with smaller families, it was probably due in part to experience gained as a result of caring for the older children thereby bringing greater success with the younger ones. The whole matter should be investigated in a more thoro manner than these data warrant.

7. EDUCATION OF PARENTS

The formal education of the parents cannot be considered important as a factor of variability in the use of medical and health agencies in Ross County, since the groups were quite homogeneous in this respect. Very few parents had progressed beyond the eighth grade and more than two-thirds had left school between the fifth and eighth grades.

SUMMARY

Ross County is about as well supplied with medical and health agencies as any rural or semi-rural county in Ohio.

Physicians were becoming urban in their location, standards of practice, and fees. This greatly increased the cost of medical service to country people that live some distance from the city and sometimes increased the difficulty of obtaining a physician because of poor communicative facilities, bad roads, and the reluctance of urban physicians to make calls by means other than motor transportation.

Most rural families had a family doctor, tho he was not necessarily the nearest doctor. The country doctor of the older type complained that his clientele deserted him in serious cases. These were taken to the urban physician, leaving for the rural physician the less profitable and emergency cases.

Country people used the hospital only in extreme cases. Nursing service, when obtained, was done by the practical nurse rather than by the graduate nurse.

Due to the educational work of the county public health organization dental work was increasing, but rural dentists reported that rural work is "eleventh hour work".

Two hundred rural families spent an average of $39.29 per family for medical and health purposes during one year. Of this amount 18.5 percent went for unprescribed drugs and remedies. Of the remaining 81.5 percent, 64.3 percent went for physician's service.

There was much variation in the economic conditions in various sections of the county and also much variation in the prevailing standards of health. In general the standards and costs of medical and health service had risen more rapidly than the health standards of the people and their ability to pay. This was particularly true of the more backward sections of the county. The results were infrequent use of medical agencies, misunderstanding as to the nature and value of service rendered by the physician, the use of patent medicines, and office calls made when the patient should be in bed.

Of the 884 people visited 43 percent had been ill during the year. There was variation by area and sex but little by age.

In 72 percent of these cases of illness some medical resource outside the family was called into use. The rate varied according to the health standards of the people, economic standing, distance from medical facilities, sex, age, and size of family.

It was evident that limited ability to pay, low health standards, and relative inaccessibility to modern medical and health agencies were serious handicaps in the hilly sections of the county. With no clinics or free service available many persons either obtained no medical service or they called a physician and paid him nothing or only in part.

A SUGGESTION

It was the purpose of this investigation to determine the facts rather than to propose remedies. A few points bearing on the solution of these difficulties may be noted, however.

It is evident that much systematic and sound health education is needed thruout the county. Health practices, generally, appear to be much below the best accepted standards of today. The assumption that health education tends to put the physician out of business is apparently not borne out by the facts, tho it is probably true that health education tends to change the nature of the physician's function. It is more probable that where ignorance prevails the patent medicine salesman puts the physician out of business. It is altogether likely that the best relationship between physician and layman occurs when the health intelligence differential is not great, that is, when the physician is health expert and the patient is intelligent cooperator. If this be true it is to be hoped that the good work of the Ross County health commissioner and his staff may be greatly extended to reach more effectively both adults and school children.

That the economic status of the people living in the more backward sections of the county constitutes a real barrier to satisfactory health practices and service cannot be doubted. Not only is agriculture unprofitable in these hills but present tendencies in land utilization do not point to a brighter future. It would seem that aid must be forthcoming from without to provide (1) health education and (2) economical techniques for supplying and maintaining health agencies, whether of a private or public nature. The problem of supplying adequate health facilities and agencies to the people of these backward areas is a social-work problem, regardless of the method of solution. The people of these areas are in both health practices and ability to pay so far below current medical standards and costs that satisfactory readjustment may be expected following only extended and sympathetic aid on a low cost level. Undoubtedly both public and private health agencies could make a contribution to this end.